REMARKS

In this present Amendment, claims 1 and 8 are amended for clarification purposes, claim 34 is amended to be in proper form, and claims 5-7, 9, 10, 12-19, 21, 23-26, 29, 30, 35 and 36 are canceled without prejudice or disclaimer.

No new matter is added, and entry of the Amendment is respectfully requested. Upon entry of the Amendment, claims 1-4, 8, 11, 20, 22, 27, 28 and 31-34 will be pending.

(a) Referring to page 2 of the Office Action, claims 34 and 35 are objected to under 37 C.F.R. § 1.75(c) as allegedly being in improper form.

The Examiner states that claims 34 and 35 are improper multiple dependent claims, since they depend from "claims 31, 32 and 33." See MPEP § 608.01(n) (any dependent claim which refers to more than one other claim shall refer to such other claims in the alternative only).

Claim 34 is amended herein to depend from claims 31, 32 and 33 in the alternative (i.e., "claims 31, 32 or 33"). Claim 35 is canceled.

Withdrawal of the objection to claims 34 and 35 is respectfully requested.

(b) Referring to page 2 of the Office Action, claim 28 is objected to for allegedly lacking support in the present specification.

Applicants respectfully traverse.

Claim 28 depends from claim 1 and recites that "the flow of the reactive catalyst to oil mixture is downwards." The subject matter of claim 28 is supported by the disclosure of the present specification, for example, at page 15, lines 28-29. Therein, Applicants disclose that "[t]he process may be applied to FCC units that comprise tubular risers as well as those that

comprise downflow reactors." In other words, with respect to claims 27 and 28, the process can be applied to FCC units where the catalyst may flow upwards or downward within the reactor.

Reconsideration and withdrawal of the objection are respectfully requested.

(c) Referring to page 2 of the Office Action, the Examiner objects to claim 1 because, except for the step of "obtaining mainly light products such as LPG," all of the steps of the process according to claim 1 are allegedly written in the form of an apparatus. Thus, the Examiner requests that Applicants amend the claims to be in the form of process steps.

Without conceding to the merits of the rejection, Applicants submit that the above-mentioned amendment to claim 1 addresses the Examiner's concerns. The Examiner is kindly requested to reconsider and withdraw the objection.

(d) Referring to page 2, the Examiner also takes the position that claims 2-36 are allegedly written in the form of an apparatus. The Examiner is of the opinion that these claims need to be rewritten in the form of process/method steps.

Applicants respectfully traverse.

Applicants submit that claims 2-36 properly depend from claim 1 by further limiting the scope of the process of claim 1. For example, claim 2 recites that feed A is a heavy distillation gasoil (HVGO), and therefore, is clear, definite and in proper form.

Reconsideration and withdrawal of the objection are respectfully requested.

(e) Referring to pages 3-12 of the Office Action, claims 1-33 and 36 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 4,218,306 ("Gross") alone or alternatively in view of U.S. Patent No. 6,416,656 ("Zhang").

Applicants traverse and respectfully request the Examiner to reconsider in view of the amendments to the claims and the following remarks.

The present claims recite a FCC process of a mixed feedstock of hydrocarbons, namely feeds A and B, wherein feed B is more refractory to cracking than A. The injections of feeds A and B are made simultaneously, but in distinct riser locations. Further, the injection location of feed A is set at a position for maximum production of LPG (see page 11, lines 25-26 of the specification), and this injection point defines the bottom of the riser reactive section.

In the presently claimed FCC process, the height between the injection locations of feeds A and B should conform to the residence time of A, which ranges from 0.5 to 2 seconds between such locations (see page 16, lines 10-13 of the specification), and the minimum residence time required for feed B, downstream, in order to undergo the desired conversion (including gasoline overcracking) and to maximize LPG production.

Thus, in the presently claimed FCC process, the conversion rise toward lighter products is observed as a result of a combination of conditions, including temperature and dispersion degree, which function together in order to minimize thermal cracking reactions and intensify the catalytic route.

For example, Table 2B at page 24 of the present specification demonstrates that the increased yield of LPG is a consequence of the maximum LPG production of feed A in the length of the reactive section corresponding to the optimum residence time for cracking feed A.

Furthermore, Table 3A and 3B demonstrate the injection conditions of feed B, for compensating the lower residence time for cracking feed B, with improved atomization and a higher temperature of feed B. Therein, it is clear that the higher temperature of case 7 leads to higher conversion, while maintaining CTO (catalyst to oil ratio). In addition, the dispersion

steam (case 4 and case 5) would lead to an increased conversion into LPG at the expense of gasoline (GLN). However, the high injection temperature of feed B is limited to a temperature that would not interfere with the thermal balance of the whole FCC unit.

Accordingly, from these examples, it is clear that the injection of feed B is not intended to promote a quenching in the riser reactive section (i.e., lowering the reactive mix temperature), but instead, the injection of feed B is intended to promote a gasoline overcracking with maximum LPG production.

Therefore, without quenching, higher yields of LPG were obtained by the presently recited process by the injection of feed B, in a highly dispersed state at an atomization temperature that is equal to or higher than the injecting temperature of A.

According to the present application, one of ordinary skill in the art would understand that imparting a high dispersion degree to feed B may reduce the corresponding residence time in the riser reactive section. This allows an upstream injection location of feed B of 80% in the riser reactive section. Also, one of ordinary skill in the art would understand that injection of feed B can be provided father up the riser bottom as a result of the higher temperature for injecting B and a resultant riser temperature for cracking feed B.

The combined conditions of the present process enlarge the section for injecting feed B (between 10 to up 80% of the riser reactive section), and therefore, the present process achieves a higher flexibility in terms of the composition of feed B as compared to the 6-30% height range disclosed in Gross.

In addition, one of ordinary skill in the art would understand from the disclosure of Gross (see column 10, lines 31-34) that charging coker oil farther up the riser provides a reversed trend in gasoline yield. Thus, one of ordinary skill in the art would clearly have appreciated that the

objective (i.e., an increased gasoline yield) of the FCC process of Gross is to limit the riser location level (from 10 to about 30 feet above) for injecting the more refractory feed for cracking.

One of ordinary skill in the art would also understand from reading Gross at column 9, lines 19-2, that if the volume of the secondary feed is increased, the level of injection of secondary feed becomes more restricted. For example, one of ordinary skill would understand from Fig.1 of Gross that Gross limits the process to a low amount of secondary feed to be injected at between 10 to 30 feet above the first injection of FF (fresh feed). This is shown in Table 2 where the examples of Gross refer to a secondary feed in an amount equivalent to 4%wt.

On the contrary, the presently claimed FCC process enables processing a higher amount (ranging from 5 to 50 wt%) of a feed more refractory to cracking that can be injected farther up the bottom riser, at one or more riser locations between 10% and 80% of the riser reactive section, preferably between 25 to 50%, which corresponds to about 30 to 80 feet of a typical riser with a height of 110 feet.

Regarding the selectivity of the process into the intended products, the process of Gross leads to an increased gasoline octane number by quenching (i.e., the second injection), which is intended for reducing thermal cracking. In view of the disclosure at column 4, lines 3-7, of Gross, one of ordinary skill in the art would clearly appreciate that the results were obtained with little or no preheating of the second feed, i.e., the second injection is used by Gross to lower the temperature of the feed-catalyst suspension (quenching) which would result in higher coke producing hydrocarbons.

In contrast, neither quenching (see page 21, line 20 of the present specification) nor gasoline octane rating (see Table 5 of the present specification) is a relevant parameter of the FCC process of the present application.

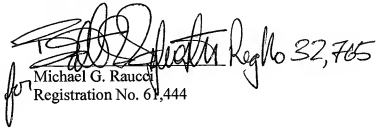
Applicants submit that it is well known to those of ordinary skill in the art that temperature increase is accompanied by higher gasoline and gas yields. See, e.g., page 19, lines 20-24. In this regard, the present application maximizes LPG production, through gasoline overcracking to LPG at the expense of the gasoline, by simultaneous segregated injections of feeds A and B, in distinct riser locations, wherein the injection conditions in a high dispersion degree of B involve: dispersion steam ranging from 5 to 20%; and a temperature equal to or higher than the injecting temperature of feed A.

In view of the above, reconsideration and withdrawal of the rejection of claims 1-33 and 36 over Gross and Zhang are respectfully requested.

Reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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